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Quarterly Progress Report

Period: January 1 to March 31, 1976

I. <u>Title of Investigation</u>: Crop Identification and Acreage
Estimation over Large Geographic
Areas Using LANDSAT MSS Data.

Contract No. NAS5-20793.
LANDSAT Investigation No. 21330.

II. <u>Problems</u>: None

III. <u>Accomplishments</u>:

Analysis of Data

Analysis of the Landsat data for Kansas is well under way;
35 of the 80 counties in Kansas that will be included in the
acreage estimations have been classified. Tabular results for
all the counties are not available as yet, but the results for
one crop reporting district, South Central Kansas have been
completed. The acreage estimates from Landsat data for the
thirteen counties in this district were compared with USDA
Statistical Reporting Service estimates for 1975 using a
paired-t test. The results of the paired-t test showed that
there was no significant difference between the two estimates.

Extending Training Statistics

A method of extending training statistics to counties with
no ground reference data has been devised. The system is based
on ancillary data and spectral information. Information on
soils, rainfall, land use and past crop history is being compiled

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and used as indicators of which counties are most alike based on these factors. Additional information is also being obtained on spectral simularities by stratification of the Landsat data by a form of clustering. The stratification is done by sampling blocks. The vectors are then compared to determine which areas are most alike.

Plans for Next Reporting Period

The remaining counties in Kansas will be classified and acreages for each computed and summarized during the next 3 months. Work should also begin on the Indiana data with the digitization of county boundaries and location of underflight data in the Landsat frames.

IV. Significant Results:

The comparison between the acreage estimates for the April Landsat data and the USDA Statistical Reporting Service estimates show no significant difference for the South Central crop reporting district in Kansas. Table 1 shows the results in percent and total acres for each of the 13 counties. A paired-t test with an α = .05 was run comparing the percentages of wheat in each county. The results of their test showed no significant difference between the two estimates for wheat.

V. Publications: None

VI. Recommendations: None

VII. Funds Expended: February 29, 1976 -- $65,708

VIII. Data Use:

	Value of Data Allowed	Value of Data Ordered	Value of Data Received
CCT	$23,800	$12,600	$12,400
Imagery	2,392	---	1,532

IX. Aircraft (NASA) Data: None

Table 1. Comparison of USDA/SRS and Landsat estimates of the proportion and area of wheat in the South Central Crop Reporting District of Kansas in 1975.

County	USDA/SRS %	USDA/SRS Acres	LANDSAT %	LANDSAT Acres
Barber	24.2	178000	17.5	128350
Commanche	22.4	115000	17.0	84040
Edwards	34.4	135000	36.8	144390
Harper	57.8	296000	54.4	278880
Harvey	40.6	140000	38.1	131670
Kingman	45.0	249000	48.9	270310
Kiowa	29.2	135000	24.3	111970
Pawnee	37.9	182000	39.8	190790
Pratt	45.0	210000	46.6	217420
Reno	46.9	377000	38.1	306020
Sedgwick	43.7	279000	33.2	212060
Stafford	38.3	195000	40.7	206820
Sumner	65.6	501000	68.8	520460
Mean	40.8		38.8	
Total		2992000		2806170